



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/556,355	11/10/2005	Hachishiro Iizuka	281154US26PCT	6745
22850 7590 06/14/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER CHEN, KEATH T	
			ART UNIT 1709	PAPER NUMBER
			NOTIFICATION DATE 06/14/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

## Office Action Summary

Application No.

10/556,355

Applicant(s)

IIZUKA, HACHISHIRO

Examiner

Keath T. Chen

Art Unit

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 02/07/2006.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 7-8 recite the limitation "the shield plate" in line 2 or 3. There is insufficient antecedent basis for this limitation in the parent claim 5. These claims will be examined as "a shield plate".

Claim 7 is interpreted as requiring the shield plate to be placed between the vaporizing chamber and the gas outlet, such that the gas cannot travel in a straight path before reaching the filter. The gas must be redirected by the shield plate in some manner.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Naoki et al. (US 6074487, hereafter '487).

'487 teaches all limitation of claim 1:

A vaporizer (Fig. 13, #206) comprising: a vaporizing chamber (S1) configured to vaporize a liquid material (M) and thereby form a gas material (M+X); a spray portion (#205, col. 11, lines 8-10) configured to spray the liquid material in the vaporizing

Art Unit: 1709

chamber; a delivery part (including #220 and #216, everything outside of chamber S1 is for delivery) configured to deliver the gas material from the vaporizing chamber to a gas outlet; and a heating portion (#215-#218) configured to heat the vaporizer, wherein the delivery part comprises a filter member (#216, porous heating element function as filter, col. 10, lines 55-57) covering the gas outlet (#216 is between sprayer #205 and outlet #220) and configured to allow the gas material to pass therethrough, and a heat transfer member (side heater #217 and top heater #218 are directly connected to #216 filter, col. 10, lines 29-34) configured to transfer heat of the heating portion to the filter member.

'487 further teaches the limitation of claim 2:

A control member (col. 14, lines 18-20) configured to control temperature of the heating portion based on temperature of the heat transfer member or the filter member (thermal coupler #221 connected to the filter, col. 10, lines 35-37).

'487 further teaches the limitation of claim 3:

The heat transfer member comprises a plurality of heat transfer members (#217 and #218).

'487 further teaches the limitation of claim 4:

The vaporizer further comprising a heater incorporated in the heat transfer member (heaters #217 and #218 are the heat transfer members, therefore, the heaters are incorporated in the heat transfer members).

'487 further teaches the limitation of claim 5:

Art Unit: 1709

The heat transfer member is in thermal contact with the filter member at a position other than a peripheral portion (#217 and #218 are in contact with the surface of the filter #216).

'487 further teaches the limitation of claim 25:

An apparatus (Fig. 1) for performing a semiconductor process on a target substrate, the apparatus comprising: a process chamber (#1, col. 6, lines 58-66) configured to accommodate the target substrate; and a gas supply system (#12, Fig. 13 is one embodiment of #12, see drawing description) configured to supply a process gas into the process chamber, wherein the gas supply system comprises the vaporizer according to claim 1.

3. Claims 1 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Sun et al. (US 6409839, hereafter '839).

'839 teaches all limitations of claim 1:

A vaporizer (Fig. 11) comprising: a vaporizing chamber (space above #150) configured to vaporize a liquid material (col. 10, lines 8-10, note aerosol is fine liquid droplet, still a liquid material) and thereby form a gas material; a spray portion (#18) configured to spray the liquid material in the vaporizing chamber; a delivery part (including #150 and everything below is for delivery) configured to deliver the gas material from the vaporizing chamber to a gas outlet; and a heating portion (#158) configured to heat the vaporizer, wherein the delivery part comprises a filter member (#160, col 10, lines 16-17) covering the gas outlet (opening below #166) and configured

Art Unit: 1709

to allow the gas material to pass therethrough, and a heat transfer member (#160B) configured to transfer heat of the heating portion to the filter member.

'839 further teaches the limitation of claim 25:

An apparatus (Fig. 2) for performing a semiconductor process on a target substrate, the apparatus comprising: a process chamber (#28, abstract) configured to accommodate the target substrate; and a gas supply system (#19, Fig. 11 is one embodiment of #19) configured to supply a process gas into the process chamber, wherein the gas supply system comprises the vaporizer according to claim 1.

4. Claims 6, 26, 24, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhao et al. (US 20030033978, hereafter '978).

'839 teaches all limitations of claim 6:

A vaporizer (Fig. 15, #154, [0081]) comprising: a vaporizing chamber (inside of #177) configured to vaporize a liquid material and thereby form a gas material ([0081], lines 4-7 and lines 12-14); a spray portion (#170) configured to spray the liquid material in the vaporizing chamber; a delivery part (everything outside of #177, including #177, is for delivery) configured to deliver the gas material from the vaporizing chamber to a gas outlet (#184); and a heating portion (#167) configured to heat the vaporizer, wherein the delivery part comprises a filter member (#180) covering the gas outlet and configured to allow the gas material to pass therethrough, and a shield plate (#177 and #178) covering the filter member on a side farther from the gas outlet.

The examiner notes that #177 and #178 can function as filter and shield plate as well.

Art Unit: 1709

Claim 24 is rejected with substantially the same reason as claim 6 rejection above, '839 further teaches the limitation of claim 24:

A heat transfer member (lower block #186, [0084], lines 21-24, describes heat transfer to #177, [0085], lines 9-12, heat transfer to #178, therefore, #180 is similarly receiving heat from lower block #186) configured to transfer heat of the heating portion (#167) to the filter (#180).

'839 further teaches all limitations of claim 26 (and 28):

An apparatus (Fig. 1, #10 CVD system, [0042]) for performing a semiconductor process on a target substrate, the apparatus comprising: a process chamber (#12) configured to accommodate the target substrate; and a gas supply system (#16, Fig. 15 is one embodiment of #16) configured to supply a process gas into the process chamber, wherein the gas supply system comprises the vaporizer according to claim 6 (and 24).

5. Claims 17, 20, 22, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim (US 6144802, hereafter '802).

'802 teaches all the limitations of claim 17:

A vaporizer (Fig. 4, #400) comprising: a vaporizing chamber (space within tube #409) configured to vaporize a liquid material (col. 2, lines 54-57) and thereby form a gas material (col. 3, lines 47-50); a spray portion (fluid inlet from top is capable of spraying fluid, #401a not labeled, at the top of vaporizer, col. 3, lines 54-57) configured to spray the liquid material in the vaporizing chamber; a delivery part (including #409, #407, #405, #403 and #401b, everything outside of vaporizing chamber is for delivery)

Art Unit: 1709

configured to deliver the gas material from the vaporizing chamber to a gas outlet; and a heating portion (#411, main heater) configured to heat the vaporizer, wherein the delivery part comprises a plate member (#407) covering the gas outlet (#401b, not labeled, at the bottom of the vaporizer) and a wall around the gas outlet (bottom of #403), with a gap therebetween to form a communication clearance, such that a gas passage (indicated by arrows) connecting the vaporizing chamber to the gas outlet is formed between the plate member and the wall (a gap between #407 and bottom of #403, having an arrow indicating the flow and the bottom of #429 in there), a plurality of columns (#405 and #403) disposed in the gas passage to serve as a fluid baffle, and a heater (#413 and #419) configured to heat the gas material flowing through the gas passage.

'802 further teaches the limitation of claim 20:

A heat transfer member (#409, thermally conductive, col. 4, lines 3-6) configured to transfer heat of the heater (#409 is subjected to radiant heat from #411, col. 6, lines 23-25) to the plate member, wherein the heat transfer member is in thermal contact with the plate member at a position other than a peripheral portion (#409 is not at the edge of #407).

'802 further teaches the limitation of claim 22:

A temperature control section (#433 and #429, temperature detector close to #407, col. 4, lines 60-65) configured to control temperature of the heating portion based on temperature of the plate member.

'802 further teaches the limitation of claim 27:



Art Unit: 1709

An apparatus (Fig. 4) for performing a semiconductor process on a target substrate, the apparatus comprising: a process chamber (bottom of Fig. 4, semiconductor device fabrication apparatus, for example, something like Fig. 1) configured to accommodate the target substrate; and a gas supply system (#400) configured to supply a process gas into the process chamber, wherein the gas supply system comprises the vaporizer according to claim 17.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 4-5 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over '839, further in view of '487.

'839 teaches all limitations of claim 1, as discussed above.

'839 does not teach the limitation of claim 4:

Art Unit: 1709

The vaporizer further comprising a heater incorporated in the heat transfer member.

'839 does not teach the limitation of claim 5:

The heat transfer member is in thermal contact with the filter member at a position other than a peripheral portion.

'487 is an analogous art in the field of vaporizer, particularly solving the problem of reliquidization (col. 10, lines 29-34) by providing heater next the the filter (heaters #217 and #218 to heating element #216 in Fig. 13).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '487 with '839. Specifically, to have provided a heater connected to the filter (#160, Fig. 11 Of '839), either directly (like #217 in Fig. 13 of '487) or indirectly (like #218 in Fig. 13 of '487) for the purpose of avoiding reliquidization, with a reasonable expectation of success, and therefore, to have obtained the invention of claim 4 and 5, respectively.

'839 and '487, together, teach all the limitation of claim 5, as discussed above.

The above arrangement that would have been obvious to a person of ordinary skill in the art would also met the limitation of claim 8:

A gas passage ('839, Fig. 11, between bottom of #150 and the top of #160 is heated by the heater #158) heated is formed between the filter member (#160) and a shield plate (#150) to deliver the gas material to the gas outlet.

The above arrangement would also have met the limitation of claim 9:

Art Unit: 1709

A clearance (between the outmost plate of #150) is formed around the shield plate to allow the vaporizing chamber (space above #150) to communicate with the gas passage (#156, which is the space below #150).

The above arrangement would also have met the limitation of claim 10:

An opening (#152) is formed in the shield plate (#150) to allow the vaporizing chamber to communicate with the gas passage

7. Claims 7, 8, 10-13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over '487, further in view of '978.

'487 teaches all limitations of claim 5, as discussed above. '487 further teaches the function of filter is to provide uniform gaseous particle (col. 11, lines 23-25).

'487 does not teach the limitation of claim 7.

'978 is an analogous art in the field of vaporizer for CVD, particularly in solving the problem of clogged vaporizer with unvaporized precursor ([0008], lines 6-10). '978 teaches the use of several tubes with varying porosities as described in claim 6 rejection above and provides sinter material having circuitous through-passages ([0051], lines 23-28). '978 further provides motivation "a vaporizer with increased surface area which exposes the mixture to a large area of evenly heated surfaces and filters out liquid droplets entrained in the flow" ([0091], lines 2-7).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '978 with '487. Specifically, to have provided multiple sintered porous plates in Fig. 13 of '487 (instead of just one porous plate #216) for the purpose to provide increased surface area to filter out liquid droplets, the inner

Art Unit: 1709

plate having larger porosity than the outer plate, with a reasonable expectation of success.

In the above arrangement, the inner sintered porous plate would have functioned as "a shield plate" the protected the outer plate (the filter in the claim). Furthermore, the circuitous through-passages would have "prevent(ed) the gas material in the vapor chamber from directly reaching the filter member"; to have obtained the invention of claim 7.

'487 teaches all the limitation of claim 5, as discussed above. '487 further provides multiple heaters on the porous filter (#217 and #218 on #216) to prevent the liquid material from being liquidized again (col. 10, lines 29-34).

'487 does not teach the limitation of claim 8:

A gas passage heated is formed between the filter member and a shield plate to deliver the gas material to the gas outlet.

As discussed in claim 7 rejection above, a person of ordinary skill in the art would have provided multiple sintered porous plates in the vaporizer of Fig. 13 of '487. From the teaching of '487, it would be obvious for a person of ordinary skill in the art to have provided a heater to each sintered porous plate for the purpose of preventing the liquid material from being liquidized again. In this arrangement, a gas passage between the filter member and a shield plate would have been heated, therefore, to have provided the invention of claim 8.

The above arrangement would have also met the limitation of claim 10 as the sinter porous plate (the shield plate) would have "an opening (the pores in the sintered

Art Unit: 1709

plate) is formed in the shield plate to allow the vaporizing chamber to communicate with the gas passage”.

The above arrangement would have also met the limitation of claim 11 as the sinter porous plate (the shield plate) would have had “the opening comprises a slit, which is bent in a thickness direction of the shield plate”, as the numerous pores in the inner sintered porous plate (shield plate) would have some slits bent in a thickness direction of the inner sinter porous plate (shield plate).

The above arrangement would have also met all limitations of claim 6, as the inner sintered porous plate function as a shield plate. This arrangement will be the basis of discussion as the following claim rejections.

The above arrangement would have also met the limitation of claim 12 as '487 provides:

A control member (col. 14, lines 18-20) configured to control temperature of the heating portion based on temperature of the filter member (#221, col. 10, lines 35-37, near the top of porous plate #216 in Fig. 13) or the shield plate.

Furthermore, '978 discloses all the limitations of claim 12 except for the placement of thermalcouple. It would be obvious matter of design choice to the location of the thermal couple, since it has been held that rearranging parts of an invention only involves routine skill in the art. In re Japikse, 86 USPQ 70.

For claim 13, '978 further teaches “to maintain the main vaporizing section at the optimum isothermal temperature ...” (emphasis isothermal, [0093], line 5). Based on the

Art Unit: 1709

arrangement above, it would have been obvious to have set the temperature control to meet the limitation of claim 13:

The temperature of the filter member (#216, Fig. 13 of '487) or the shield plate is set at substantially the same as the temperature of the heating portion.

The above arrangement would have also met the limitation of claim 15 as the sinter porous plate (the shield plate) would have had "a heater incorporated in the shield plate".

8. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over '978 and '487 as applied to claim 12 above, and further in view of Metzner et al. (US 6454860, hereafter '860).

'978 and '487 teaches all limitations of claim 12, as discussed above. Furthermore, '978 teaches "to maintain the main vaporizing section at the optimum isothermal temperature ..." (emphasis isothermal, [0093], line 5). '487 further provides multiple heaters on the porous filter (#217 and #218 on #216) to prevent the liquid material from being liquidized again (col. 10, lines 29-34).

'978 and '487, together, do not teach the limitation of claim 14:

A temperature sensor disposed at the shield plate, wherein the control member is configured to control the temperature of the heating portion based on a signal detected by the sensor.

'860 is an analogous art in the field of vaporizing (title), particularly in solving the precursor vapor condensation problem (col. 2, lines 21-24). '860 teaches the use of a

Art Unit: 1709

plurality of independent thermocouples (col. 18, lines 16-21) to achieve uniform temperature (col. 18, lines 53-37).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '860 with '978 and '487. Specifically, to have provided a plurality thermocouples in the arrangement discussed in claim 8 rejection above (Fig. 13 of '487, with multiple sintered porous plates, each with a heater and a thermocouple) for the purpose to achieve uniform temperature. Particularly, to have provided one thermocouple on the inner sintered porous plate (shield plate) to avoid the liquidization (condensation) of the vapor in the pores of the porous plate, with a reasonable expectation of success, to have obtained the invention of claim 14.

9. Claims 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over '978 and '487 as applied to claim 12 above, and further in view of Sun et al. (US 6409839, hereafter '839).

'978 and '487, together, teach all limitations of claim 12, as discussed above.

'978 and '487, together, do not teach the limitation of claim 16:

The heating portion comprises a heater embedded in a wall of the vaporizing chamber.

'839 is an analogous art in the field of vaporizer, particularly in solving the problem of temperature non-uniformity and particulate formation (col. 2, lines 17-22). '839 provides an imbedded heater to the walls to heat the interior chamber and filter (Fig. 10, #126, col. 9, lines 30-33) which is integrated with the vaporizer (col. 9, line 66 to col. 10, line 2).

Art Unit: 1709

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '839 with '978 and '487. Specifically, to have imbedded heaters in the walls of the vaporizer chamber (#202, Fig. 13 of '487) in the arrangement discussed in claim 8 rejection above (Fig. 13 of '487, with multiple sintered porous plates, each with a heater and a thermocouple) for the purpose to improve temperature uniformity to have obtained the invention of claim 16.

10. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over '802, further in view of Ushlkoshi et al. (US 5683606, hereafter '606).

'802 teaches all limitations of claim 17, as discussed above. '802 further teaches that the plate member (#407 support) as ceramic ('802, claim 6), being heated by radiant heat, an indirect heating method, (col. 4, lines 10-11), and the invention is to improve the heat efficiency of the heater (col. 2, lines 19-22).

'802 does not teaches the limitation of claim 18:

The heater is embedded in the plate member.

'606 is an analogous art in the field of CVD (col. 1, lines 6-11), particularly in heating devices. '606 teaches that indirect heaters can be used, but the heating efficiency is not good and particulates can be produced (col. 1, lines 14-21). '606 discloses a ceramic heater (Fig. 6, #22) with wires embedded in the ceramic substrate which has excellent performance in the production of semiconductor (col. 1, 20-27) and overcomes the problems of poor heating efficiency and particulate production.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '606 with '802. Specifically, to have provided



Art Unit: 1709

an active ceramic heater taught by '606 to the support #407 of the vaporizer in Fig. 4 of '802 since '606 teaches the ceramic heater has better heating efficiency than indirect heaters and has excellent performance in semiconductor production.

'802 further teaches the limitation of claim 19:

The plate member (#407, heated support) has a surface facing the vaporizing chamber and configured to serve as a vaporizing surface (col. 6, lines 24-27) for vaporizing the liquid material.

11. Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over '802.

'802 teaches all limitation of claim 20, as discussed above. '802 teaches one concentric column (#409) as the heat transfer member. '802 further teaches the advantage of lengthens the flow path of the fluid to efficiently heating the semiconductor gas (col. 7, lines 16-23).

'802 does not teach the limitation of claim 21:

The plurality of columns serve as the heat transfer member.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have extended the teaching in '802 and further lengthen the flow path of the apparatus in Fig. 4. Specifically, to have added additional tubes like #409 or two additional tubes like #409 and \$405 on the bottom plate (support #407) and to have extended the flow path even more. Therefore, to have had plurality of columns serve as the heat transfer member, each column being connected to the plate member (support #407) at a position other than a peripheral portion.

Art Unit: 1709

12. Claims 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over '802, further in view of '978.

'802 teaches all limitations of claim 17, as discussed above. '802 further teaches to lengthen the flow path of the fluid in the small space (col. 7, lines 19-23) to efficiently heat the gas. Specifically, through the flow bending the in holes #409a and #405a in Fig. 6 and Fig. 7.

'802 does not teach the limitation of claim 23:

A filter member covering the gas outlet and configured to allow the gas material to pass therethrough between the gas outlet and the plate member.

'978 is an analogous art in the field of vaporizer for CVD, particularly in solving the problem of clogged vaporizer with unvaporized precursor ([0008], lines 6-10). '978 teaches the use of porous material to provide additional surface area in vaporizer ([0084], lines 12-16). '978 further provides motivation "a vaporizer with increased surface area which exposes the mixture to a large area of evenly heated surfaces and filters out liquid droplets entrained in the flow" ([0091], lines 2-7).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '978 with '802. Specifically, to have provided sintered porous plates to cover the gas outlet holes at the bottom of #403 in Fig. 4 of '802 with the sintered porous material as filter to further lengthen the flow path, to entrap any liquid droplets, to expose the mixture to large evenly heated surface and to filter out liquid droplets; and therefore, to have obtained the invention of claim 23.

Art Unit: 1709

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1-5 and 25 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4-8, and 10-12 of copending Application No. 10/565,676 in view of '487.

Claims 1, 4-8, and 10-12 of copending Application No. 10/565,676 teaches a vaporizer containing a spraying portion, chamber, delivery part (draining unit), heating unit for vaporizer, filter, heater for filter, and a semiconductor reaction chamber.

'487 is an analogous art in the field of vaporizer, particularly solving the problem of reliquidization (col. 10, lines 29-34) by providing heater next to the filter (heaters #217 and #218 to heating element #216 in Fig. 13). '487 further teaches a temperature control unit, a plurality of heater and heat transfer means and positions. It is obvious for

Art Unit: 1709

a personal of ordinary skill in the art to integrate the various heating methods and control to the vaporizer in No. 10/565,676, as set forth in the 102 rejection above, to obtain the claims 1-5 and 25 of the instant application.

This is a provisional obviousness-type double patenting rejection.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 4550706, 5032461 and 3888649 are cited for a shield in front of filter; 2003/0033978 for heated filter; 6207239 for plate member; 6210485 for filter, all related to vaporizer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keath T. Chen whose telephone number is 571-270-1870. The examiner can normally be reached on M-F, 8:30-5:00 EST.

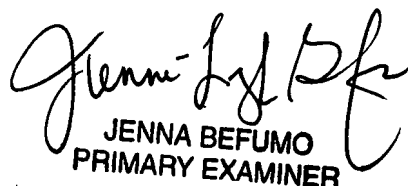
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1709

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

kc

K.C.

  
JENNA BEFUMO  
PRIMARY EXAMINER